

Private forest policy tools: A national survey exploring the American public's perceptions and support

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Abstract

This research examines the general public's perceptions of policy tools for private forests and examines the relationships between policy support and individual demographic characteristics, as well as timber harvesting attitudes. Empirical data were collected through a random digital dial telephone survey of United States residents in 2003 and 2004. Factor and reliability analyses were used to define a private forest policy tool scale containing two distinct policy tools—authority (regulations, sanctions, and incentives) and empowerment (learning, capacity-building, symbolic, and incentive) tools. Overall, the public held neutral attitudes towards authority tools and supported empowerment tools. Of all the demographic characteristics examined in this research, general linear modeling indicated that only education significantly predicted support for authority and empowerment tools. Timber harvesting attitudes were effective predictors of empowerment tools; in general, support for timber harvesting for present benefits was negatively related to support for private forest policy tools. Implications for private forestland policy are presented.

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1. Literature review

1.1. Private forests

Private forests of the United States provide numerous private and public benefits, including

commodities, clean water, clean air, wildlife habitat, recreation opportunities, and aesthetic values. Non-industrial private forests (NIPFs) or family forests, which comprise nearly 262 million acres in the United States (about 42% of the total U.S. forestland) are owned by approximately 10.3 million individuals (Butler and Leatherberry, 2004). Best and Wayburn (2001) contend that private forests face three challenges: degradation, fragmentation, and conversion. These three threats to the sustainability of forestland

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are due in part to many current socio-demographic trends, such as amenity-driven relocation, which is labeled as an economic and demographic engine that shows no signs of slowing (Sampson and Decoster, 2000). From 1993 to 2003, there has been an 11% increase in the number of NIPF owners (Butler and Leatherberry, 2004). Exurbanization and development in forests throughout the landscape are leading to forest ownership by different demographic groups, some of which express notably different opinions on forests and more broadly, the environment (Egan and Luloff, 2000).

The public receives many benefits, both tangible and intangible, from private forests. It is critical that we examine the responses and reactions to forest policies by not only the targets of those policies, the non-industrial private forest owners, but also other stakeholders affected by the implementation of those policies including the general public (Pregernig, 2001). Public awareness may lead to more successful forest conservation strategies and policies, as the public may be more cognizant of private forest issues and be more willing to invest, along with the owners, in private forests (Best and Wayburn, 2001). Understanding public opinion related to policy issues and examining the influence of demographic characteristics on specific policy preferences can facilitate an understanding of the context for private forest policy in the United States (Brace et al., 2002).

Numerous studies have examined forest landowners' attitudes, motivations, and behaviors (Young and Reichenbach, 1987; Bliss and Martin, 1989; Bliss et al., 1994; Bourke and Luloff, 1994). Others have studied the attitudes of the general public toward national forest management (Bengston, 1994; Steel et al., 1994; Manning et al., 1999; Vaske et al., 2001; Tarrant and Cordell, 2002). However, there has been little work that has documented *public* attitudes towards *private* forests, both in terms of the actual forest resource and the policy tools employed for managing that resource. We posit that it is important to begin to understand the broader public's preferences for private forest policy, and that to do such, one must also examine factors that influence these preferences. Policy makers and decision makers must consider values and attitudes when formulating policy (Bourke and Luloff, 1994; Tarrant and Cordell, 2002), as well as the broader social, political, environmental,

and economic context in which the policies are formed (Vaux, 1986; Salazar and Cubbage, 1990; Cubbage, 1991). By understanding the range of agreement or disagreement with particular policy tools, we can begin to understand how fair and legitimate the public considers such private forest policy options, which is a precursor to developing and implementing well-received and successful policies (Knetsch, 1995).

1.2. Policy tools

In this paper, we consider the range of policy tools available to address private forestland conservation. Public policy tools or instruments are the underlying method or approach through which the government seeks to achieve a policy objective (Salamon, 1989). Policy tools are employed to cause certain behaviors or effect changes in behaviors of those citizens to whom the policy is directed (Schneider and Ingram, 1990). In other words, policy tools are used to dissuade, prevent, promote, or enable certain behaviors (Schneider and Ingram, 1990). The goals of policy are often to get people to engage in behaviors that they might not otherwise engage in or to provide people with the ability to carry out the desired behavior (Schneider and Ingram, 1990).

Various frameworks and classification schemes exist to describe policies (Smith, 2002). For example, policy tools can be divided into three categories: *carrots*—policies that offer incentives, typically economic, to encourage a particular behavior; *sticks*—policies that are regulatory in nature; and *sermons*—policies that are informational, such as education and outreach programs (Bemelmans-Videc et al., 1998). Other researchers parse out additional underlying differences in policy tools. For example, Schneider and Ingram (1990) created a framework based on the behavioral assumptions associated with the policy tool. In this more extensive classification system, the authors propose five categories of policy tools: authority, incentive, capacity-building, symbolic/hortatory, and learning. This behavioral approach facilitates an examination of the circumstances necessary to result in the desired change. In this framework, the tools range from coercive (authority) to facilitative (capacity-building, symbolic/hortatory, and learning tools). Authority tools assume that there is a hierarchy,

implying that policy targets will obey the dictates of the policy, which may be granting permission, forbidding action, or mandating certain behaviors (Schneider and Ingram, 1990). Incentive tools assume individuals are utility-maximizers and that a pay-off or financial penalty is necessary to motivate policy targets to follow policy (Schneider and Ingram, 1990). For incentive policy tools, the financial consequences (either positive or negative) must be tantamount to the social benefit or cost the policy addresses. Capacity, symbolic/hortatory, and learning tools leave more of the decision to enact the behavior up to the individual. Capacity tools assume that proper and adequate information is necessary to cause the desired action by the individual (Schneider and Ingram, 1990). Hence, capacity tools provide the knowledge, resources, or ability to make the decision, which is assumed to be the desired behavior if the appropriate information is available. Symbolic and hortatory tools recognize the role that values and beliefs play in the decision to engage in the desired action, and rely on the assumption that if a policy is viewed as consistent with the target population's values, it will be accepted and followed (Schneider and Ingram, 1990). Learning tools rely on the interaction between policy targets and policy-makers to determine the best way to address a problem (Schneider and Ingram, 1990). This exchange and engagement shape the selection of additional policy tools to address the problem. As noted by Weiss (2000), informational policy tools, such as capacity and symbolic/hortatory tools, do not attempt to change the policy target's values, but rather rely on existing values. Values may have the potential to change in situations in which they are questioned and considered (Weiss, 2000), which is the role of learning tools.

1.3. Policy tools for private forests in the United States

Policy tools differ with regard to public and private forestlands. Most public forest policies are regulatory in nature, whereas most private forest policies employ tools that primarily use incentives or information and education. Current policies that exist for private forests could be classified according to the Bemelemans-Videc et al. (1998) 3-category framework: (1) *carrots or incentive tools*, taking the form

of cost-sharing and tax abatement or assistance; (2) *sermons or capacity tools*, the informational and educational workshops and publications available to forest owners, as well as technical assistance; and (3) *sticks or authority tools*, the regulatory aspects of the Forest Practices Acts that exist in many states in the U. S. (Cubbage et al., 1993; Ellefson and Cheng, 1994; Boyle and Teisl, 1999; Best and Wayburn, 2001). In a recent study of state and provincial timber harvesting practice policies in the U.S. and Canada, researchers found that 61% of these policies are voluntary in nature, whereas 39% are regulatory (Kilgore and Blinn, 2004). In the U.S., thirty-eight states have one or more regulating policies for private forest practices, although the number of states with comprehensive forest practices laws is far fewer, with significant variation among these comprehensive programs (Ellefson et al., 1997).

Many current forest practice laws stemmed from regulations that were developed in the early 1900s and have since incurred major revisions (Salazar and Cubbage, 1990; Ellefson and Cheng, 1994). A dramatic increase in Forest Practice Acts in the West occurred in the 1970s and in the East in the 1980s, although regional differences in private forest policies still exist (Cubbage and Siegel, 1988; Salazar and Cubbage, 1990), especially those developed by local governmental bodies (Martus et al., 1995). Many suggest that the trend is toward increasing regulation of private forest practices (Cubbage and Siegel, 1988; Cubbage, 1991; Ellefson et al., 1997; Zobrist and Lippke, 2003). Further, some regulations for private forest practices are contained in state-level rules responding to threatened and endangered species listings under the Endangered Species Act (e.g. Washington's 'Forests and Fish' rules) (Zobrist and Lippke, 2003). Other private forestland policy tools are of the incentive typology (especially cost-shares like Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP), Stewardship Incentives Program (SIP)), many of which originated in the 1990 Farm Bill (Best and Wayburn, 2001) and were revised or augmented in the 2002 Farm Bill. The 1990 Farm Bill was the first to contain forestry specific programs (SIP, Forest Stewardship Program (FSP), and Forest Legacy Program), forming the basis for future legislation

for non-industrial private forests (Best and Wayburn, 2001). Incentive-based NIPF policies have received criticism as ineffective policies (Bourke and Luloff, 1994; Brockett and Gebhard, 1999; Kluender et al., 1999). Others maintain incentives are more effective than regulations and can be particularly useful when implemented in concert with other policy tools (Zhang and Flick, 2001).

1.4. Individual characteristics and policy tool preferences

We hypothesize that individual demographic characteristics shape policy tool preference. Of particular interest are political party affiliation and political ideology. Analysis of 1994 NORC General Social Survey data reveals that political ideological and party affiliation are the main determinants of an individual's support for increased governmental spending for environmental issues and increased taxes, with liberal and Democrats expressing significantly more support for such measures than their counterparts (Guber, 2003). Further, previous research indicated that Republicans and more politically conservative individuals are less concerned about the environment than individuals with opposing political viewpoints (Van Liere and Dunlap, 1980; Jones and Dunlap, 1992). Thus, we expect Democrats and more liberal individuals to be more supportive of the various private forest conservation policies proposed in our framework.

Characteristics such as race, gender, education, income, and religiosity are hypothesized to shape policy tool preferences. Previous work has indicated that minorities are more supportive of environmental regulations (Kahn, 2002). Thus, we predict that individuals self-identifying as minorities will be more supportive of private forest authority policy tools. Previous studies have shown that females are more concerned about environmental issues (e.g. Mohai, 1992) and thus we extend this to greater support of policy tools to promote private forestland conservation. In a study of landowners in the Missouri Ozarks, findings indicated that higher education levels were related to less concern about regulations of land (Raedeke et al., 2001). In a study of General Social Survey data, Kahn (2002) found that college graduates were slightly more likely to support environment

regulations than individuals who did not graduate from high school. Following, we predict that individuals with lower education levels will express less favorable opinions towards regulations than respondents who have attained more education. Income also is predicted to influence support of policy tools. Schneider and Ingram (1990) suggest that individuals of lower incomes will not support sanctions imposed by disincentive policy tools. Respondents in lower income brackets may favor positive incentive tools, as financial status may be prohibitory to otherwise engaging in forest conservation practices. Bliss et al. (1994) found that while support for regulations on private land was generally high, individuals with lower incomes favored regulations the most. Other research has demonstrated that landowners of higher incomes and increased education are likely to favor and use incentive policies (Kluender et al., 1999). Previous research has demonstrated that there is a negative relationship between religiosity and support for environmental protections, thus religious individuals may be less likely to support any of these tools (Kanagy and Nelsen, 1995). However, in the past several years, some religious organizations (e.g. National Religious Partnership for the Environment (<http://www.nrpe.org/>)) appear to be taking a more pronounced stance, especially politically, in promoting environmental awareness (Motavalli, 2002). This fledgling movement may induce pro-environmental attitudes and environmental policy support in constituencies typically considered less pro-environmental.

1.5. Timber harvesting attitudes and policy tool preferences

We hypothesize that timber harvesting attitudes will shape support for private forest policy tools. While no research exists that examines how the general public's attitudes towards timber harvesting relate to policy preferences, we are able to develop several predictions about the types of influence attitudes may exert on policy preference. Pregernig (2001) offers postulations as to how forestry professionals' value orientations (environmentalist, conservationist, traditionalist, entrepreneur, materialist, outsider) may influence policy preference (regulations, incentives, information tools). From this, we

propose that individuals who oppose cutting and removing of trees on both public and private forests will be more likely to support authority policy tools for private forests. [Rauwald and Moore \(2002\)](#) found that individuals in the U.S. who possess more utilitarian environmental attitudes are less likely to support incentive policies. However, there is evidence of a positive correlation between those who support economic uses of the forest and those who support the use of incentive tools ([Kluender et al., 1999](#)). We hypothesize that respondents who hold the view that economic benefits are important components of forests and forest ownership will be more apt to approve of the use of incentive policy tools. Further, individuals who support timber harvesting for non-economic reasons may be more likely to consider capacity-building or learning tools as important tools in private forest conservation.

2. Objectives

The objectives of this research were to: (1) develop an effective measurement scale for assessing private forest policy tool preference, (2) assess the American public's support of and preferences for private forest policy tools, (3) determine the influence of individual characteristics (gender, race, age, education, income, political party, political ideology, and religiosity, and through case studies of 2003 data, forestland ownership and region of residence) on private forest policy tool support, (4) explore the contribution of timber harvesting attitudes to private forest policy tool support, and (5) offer policy recommendations based on these findings.

3. Methods

Several statistical techniques were employed in this research, including: (1) factor analysis (via principal components analysis)—a data reduction technique that generates factors based on underlying structure in data ([Tables 2 and 3](#)), (2) simple descriptives (e.g. range of scores, overall trends, percentage of responses to each item) ([Tables 4 and 5](#)), (3) general linear modeling—a robust extension of typical linear regression that accommodates

continuous and categorical independent variables ([Table 6](#)), and (4) ordinary least squares regression ([Table 7](#)). All statistical tests were conducted with SPSS Version 12.0 on survey data collected in 2003 and 2004.

3.1. Data collection and sample

In 2003 and 2004, random-digit-dial surveys were conducted through the Social Research Institute of Purdue University's Department of Sociology, West Lafayette, Indiana, U.S. A pilot study of the survey was conducted in 2002, subsequent to which items were modified for the 2003 and 2004 surveys reported on in this paper. Survey Sampling International of Fairfield, Connecticut, provided the random-digit-dial samples in each year. The survey sample contained a random sample of phone numbers in the continental United States. Telephone interviewers conducted the survey with CATI (Computer Assisted Telephone Interviewing) software. Given that there were no predicted temporal effects on the survey participants' responses, data collected in 2003 and 2004 were combined and analyzed together, with the exception of the case study on 2003 data.

Comparison to U.S. Census data indicates that our survey sample (i.e. the combined data from 2003 and 2004) has a higher percentage of whites and females, as well as increased education attainment than the U.S. population ([U. S. Census Bureau, 2002](#)) ([Table 1](#)). Approximate response rates were 42.5% ($n=171$) in 2003 and 50.0% ($n=173$) in 2004. After removal of outliers, the total sample size for the combined database was $n=340$. Participant responses of "don't know" or "refuse to answer" to all questions were recoded as system missing. As an additional check to ensure there were no unexpected temporal variations, we included a year variable in initial model-building. Once the insignificance of the year variable was confirmed, we removed it from the models.

Additionally, the survey conducted in 2003 contained questions on forestland ownership and region of residence that were not asked of respondents in 2004. Therefore, in addition to analysis of the combined-years data, we conducted case studies on the 2003 data alone, to examine responses to these questions. After removal of outliers, the sample in 2003 was $n=167$.

Table 1
Respondent demographics in 2003 and 2004 as compared to 2000 U.S. Census data

	2003 and 2004 combined <i>n</i> = 340	2000 U.S. Census Bureau ^a <i>N</i> = 281,421,906
Race ^b (%)		
White	78.5	69.1
Non-White	21.5	n/a
African-American	n/a	12.3
Asian	n/a	3.6
Native American	n/a	0.9
Hispanic	n/a	12.5
Multi-racial	n/a	2.4
Other	n/a	5.6
Age ^c (median in years)	48.5	35.3
Gender ^d (%)		
Female	62.2	51.7
Male	37.8	48.3
Education ^e (%)		
Less than high school	7.7	19.6
High school degree	19.8	28.6
Vocational/ technical degree	13.9	n/a
Some college	26.6	21.0
College degree	21.6	21.8
Professional/ grad degree	10.3	8.9
Income (median)	US\$35,000– <\$75,000	US\$41,994
Political party ^f (%)		
Republican	38.6	n/a
Neither (independent)	27.3	n/a
Democrat	34.1	n/a
Political ideology ^f (%)		
Conservative	66.5	n/a
Liberal	33.5	n/a
Religious ^f (%)		
Yes	77.3	n/a
No	22.7	n/a

^a Population value from: <http://www.census.gov/population/www/cen2000/briefs.html>.

^b U.S. Census percentages do not total 100 because individuals could have indicated more than one race.

^c Our sample was restricted to individuals aged 18 years of age or older; Census estimate includes all individuals.

^d U.S. Census percentages reflect gender ratio for the population greater than 18 years of age.

^e U.S. Census percentages reflect values for the population greater than 24 years of age.

^f Additional sample descriptives, unavailable from U.S. Census.

3.2. Scale development for timber harvesting attitudes

The results of the factor analysis are explained in methods, as this statistical procedure provides for the creation of factor scores that are used in subsequent analyses presented in results. The scale (i.e. survey items) that we used to measure timber harvesting attitudes was based in part on prior studies of these attitudes in adults and youth (Harmon et al., 1997; Broussard et al., 2001). In this study, the scale was revised to include additional concepts to measure the putative multiple dimensions of timber harvesting attitudes. Five-point Likert scale categories, ranging from strongly disagree to strongly agree, comprised the response choices for the 13 timber harvesting attitude survey items asked each year.

Before conducting factor analysis, several standard diagnostic tests to determine whether data were well-suited for factor analysis were conducted. The Kaiser–Meyer–Olkin (KMO) test for sampling adequacy indicates whether the data (i.e. the 13 survey items) will factor well by examining correlations and partial correlations. The overall KMO score can range from 0 to 1.0; KMO score should be above 0.60 to proceed with factor analysis (Norušis, 2003). Bartlett's test of sphericity examines the data to test whether the correlation matrix is an identity matrix, in which case factor analysis should not proceed. Bartlett's test should be significant to proceed. For this data, the overall KMO for the timber harvesting attitudes scale was 0.775 and significance for Bartlett's test was $p < 0.001$, both indicating that the data for the items on our timber harvesting attitudes scale were well-suited for factor analysis. The anti-image matrix also revealed a pattern supporting factor analysis (i.e. the off-diagonal scores were small).

Scale development for both timber harvesting attitudes and private forest policy tools was achieved by using the principle components analysis extraction method on the correlation matrix. Factors with eigenvalues over 1, a standard criterion for determining factor selection, were extracted (Netemeyer et al., 2003). Varimax rotation with Kaiser normalization, a form of orthogonal rotation which minimizes factor (or component) correlation, generated the rotated component matrix. From this, factor scores were saved as regression variables, a refined approach to

factor score computation that considers the weighted influence of all items on a factor, rather than just those items that load greater than 0.5 (i.e. the coarse approach) (Grice, 2001). Because factor scores were created as standardized regression variables, the mean is 0 and standard deviation is 1. Subsequent analyses were conducted on these factor scores.

Exploratory factor analyses of the timber harvesting attitudes scale produced three factors, named as follows for survey items with the dominant factor loadings: (1) harvesting for present benefits (dominant items include harvesting on public and private forests, freedom of property owners to use forestland as they deem fit, harvesting as related to wildlife benefits, and negatively loading, a statement about forest legacy), (2) harvesting for economic and utilitarian reasons (dominant items relate to individual and societal economic benefits and provision of forest products), and (3) harvesting as tool of forest management (dominant items are about harvesting,

in concert with planting, fire prevention, and forest health improvement) (Schaaf et al., *in press*) (Table 2). These three factors account for 47.97% of the variance. Also important to the creation of an effective scale is the reliability of the scale. We examined reliability of the attitudinal scale with Cronbach's alpha, which can range from 0 to 1.0. For this measure of the internal consistency of a scale, the closer alpha is to 1.0, the more reliable the scale. The overall timber harvesting attitudes scale (i.e. the 13 items) exhibited a Cronbach's alpha of 0.75, indicating a reliable scale.

3.3. Scale development for private forest policy tools

For the policy tool scale, we constructed item statements that represented each of the five categories of policy tools proposed by Schneider and Ingram (1990): authority, incentive, capacity, symbolic/hortatory, and learning. All items in this scale were asked in

Table 2

Rotated component matrix for 13-item timber harvesting attitudes scale for 2003–2004 combined data, presenting survey items (left-hand column) with factor loadings for each of the three extracted factors^a

Survey items	Factors with factor loading score		
	Factor 1: harvesting for present benefits	Factor 2: harvesting for economic and utilitarian reasons	Factor 3: harvesting as a management tool
1. It is okay to cut and remove trees from public forestland.	0.709	0.227	0.028
2. It is okay to cut and remove trees from private forestland.	0.694	0.083	0.228
3. People who own forestland have a right to use it as they see fit.	0.526	0.129	–0.056
4. A responsibility of people who own forestland is to take care of it for future generations.	– 0.625	–0.129	0.380
5. Forests should be left untouched by humans.	–0.319	– 0.627	–0.056
6. Harvesting is good for the economy.	0.130	0.737	0.064
7. Forests should be used to produce products such as paper or lumber that humans can use.	0.188	0.689	0.145
8. Cutting and removing trees from a forest can improve habitat for wildlife.	0.623	0.252	0.161
9. Some forest management by humans is necessary.	–0.018	0.176	0.621
10. Cutting and removing trees is sometimes necessary to provide economic profits to the forest owner.	0.092	0.623	0.122
11. Cutting and removing trees should be following by planting trees.	–0.239	–0.014	0.621
12. When necessary, trees should be cut and removed from forests to prevent forest fires.	0.137	0.118	0.670
13. Cutting trees can sometimes be good for a forest.	0.277	0.134	0.612

^a Bolded loading indicates a value of greater than 0.40, which can be considered an item dominant enough to contribute to the latent or underlying theme of the factor. Thus, factors are named according to these heavier loadings. The general rule of thumb is to consider loadings greater than 0.40 (Netemeyer et al., 2003).

relation to private forests. In none of these statements was a particular government body specified, nor was one suggested by the telephone interviewers. If a goal was specified in the item statement, it was consistently private forestland conservation. Conservation was selected as the policy goal in these statements because of its neutral connotations (as opposed to preservation) and relative familiarity to the general public. This term was not further defined for respondents by telephone interviewers. Twelve items were asked in both years of survey administration; ten items were retained in the final framework. Two items (the government should use famous people to help promote forest conservation; and, the government should get input from private forest owners before it develops forest management policies) were dropped from the scale because their inclusion reduced reliability of the scale. Five-point Likert scale categories comprised the response choices.

Because we sought to understand the public's perceptions of policy tools, as well as the relevance of the theoretical framework, we first examined the policy tools scale in light of the original theoretical framework and subsequently through exploratory factor analysis. The theoretically derived factor framework consisted of the five major policy tool groups, wherein the reliability of the *a priori* hypothesized factors were (1) authority ($\alpha=0.73$), (2) incentives and fines ($\alpha=0.67$), (3) symbolic/hortatory ($\alpha=0.62$), (4) learning ($\alpha=0.58$) and (5) capacity (single-item measure). Although the Cronbach's alphas for the subscales were all above 0.50, indicating reliability, we proceeded towards exploratory factor analysis for two reasons. First, we wished to determine if more reliable subscales were present in the data (i.e. if an empirically derived framework would be more reliable than the theoretically driven framework); and second, we sought to understand how the public perceives policy tools, not just how theory frames policy tools. Because exploratory factor analysis creates a factor structure according to correlations between responses to items, rather than with *a priori* designated relationships, we used exploratory factor analysis to realize if and how the public partitions policy tools.

Analyses for scale development were conducted for the combined-years dataset. Preliminary tests of KMO (KMO=0.814) and Bartlett's test of sphericity

($p<0.001$) indicated that factor analysis was appropriate for this data. The anti-image matrix pattern corroborated this conclusion. The framework generated by exploratory factor analysis (through principal components analysis) consisted of two factors: (1) empowerment tools (including symbolic/hortatory, capacity, learning, and to a lesser degree, incentive tools) and (2) authority tools (including regulations, fines, and to a lesser degree, incentive tools) (Table 3). We designated the first emergent factor as "empowerment tools", because the items that loaded most heavily related to policies that provide the knowledge, tools, and ability for policy targets to achieve policy goals. The second factor was designated "authority tools", as items encompassing regulations and sanctions exhibited the highest factor loadings. The single item relating to incentives loaded on both factors. The two factors accounted for 53.04% of the variance. Overall reliability for this 10-item scale was $\alpha=0.81$. Subscale reliability was $\alpha=0.74$ for the empowerment tools subscale and $\alpha=0.78$ for the authority tools subscale. Items loading at greater than 0.40 were considered as contributing to the factor for this subscale reliability analysis. In summary, rather than use the 5-factor framework, we decided to use the 2-factor framework, because of higher reliability and the ability to analyze the public's perceptions of policy tools.

We also described the sample in terms of overall percentages of disagreement, neutrality, and agreement for each subscale. To determine the range of neutrality for each subscale, we computed factor scores for a series of hypothetical respondents. These scores were determined based on the factor structure and loadings already derived from the sample, as described above. We first calculated factor scores for each of the subscales for a hypothetical individual who expressed neutral attitudes (response=3) for all items on the scale, which corresponds to overall neutrality. This value is the center of our neutral range. We then determined two scores for each subscale that we posit correspond to the bounds of the neutrality range for each subscale. One of these scores is for a hypothetical respondent who expressed neutral attitudes for every item that dominated (loading of 0.40 or greater) the given subscale and strongly disagreed (response=1) with every other item. The second score was for a hypothetical

Table 3

Rotated component matrix for 10-item policy tools scale for 2003–2004 combined data, presenting survey items (left-hand column) with factor loadings for the two extracted factors^{a,b}

Survey items	Original framework tool	Factors with factor loading score	
		Factor 1: empowerment tools	Factor 2: authority tools
1. The government should be able to regulate the use of forests located on private land.	Authority	0.000	0.772
2. The government should have the right to tell private forest owners how to manage their forests.	Authority	0.023	0.836
3. There should be regulations regarding the cutting of trees on private forestland.	Authority	0.291	0.709
4. The government should fine private forest owners who fail to practice forest conservation.	Incentive	0.363	0.682
5. There should be financial incentives, such tax credits or grants, to encourage private forest owners to practice conservation.	Incentive	0.479	0.460
6. The government should conduct workshops on forest conservation techniques for private forest owners.	Capacity	0.686	0.275
7. The government should promote understanding of forest conservation.	Learning	0.636	0.102
8. The government and private forest owners should work together toward forest conservation.	Learning	0.698	0.151
9. The government should use positive images, such as Smokey the Bear, to promote forest conservation.	Symbolic/hortatory	0.689	0.076
10. The government should use negative images, like floods and mudslides, to show the negative consequences of not conserving forests.	Symbolic/hortatory	0.653	0.057

^a Bolded loading indicates a value of greater than 0.40, which can be considered an item dominant enough to contribute to the latent or underlying theme of factor.

^b The survey items were asked of participants as listed above. No definitions of government or conservation were given to respondents by telephone interviewers.

respondent who was neutral on dominant items and strongly agreed (response=5) with every other item. We then used these neutral boundaries to determine the percentage of respondents in our sample who disagreed with the tool/attitude (i.e. subscale scores fell below the lower bound of neutrality), fell within the range of neutrality, and agreed with the tool/attitude (i.e. subscale scores were above the upper bound of neutrality). To compare whether the sample mean for each subscale (0) differed from the neutral point on the subscales, we used a Z-test.

3.4. MANCOVA and regression

General linear models were used to examine the effects of individual characteristics in shaping private forest policy tool preference. Individual characteristics examined in this research include (1) gender, (2) race, comprised of white and non-White (encompassing African American, Asian American, Native American, Latino, and multi-racial individuals), (3) age, (4)

education, measured with categories of less than high school, high school graduate, vocational or technical training, some college, college graduate, or post-graduate degree, (5) income, comprised of categories representing lower income (less than \$15,000–under \$35,000), middle income (\$35,000–under \$75,000), and upper income (\$75,000 and above), (6) political party, represented by categories of Democrats, Republicans, and Independents, (7) political ideology, represented by categories of Conservative and Liberal, and (8) religiosity, represented by categories of religious and non-religious.

General linear models are an appropriate way to examine influence of both categorical and continuous independent variables in predicting a continuous dependent variable. The particular general linear model employed in this research is MANCOVA (multivariate analysis of covariance). Individual demographics were added to the model as fixed factors, due to their categorical measurement level; age was added as the covariate, due to its interval

measurement level. The continuous response variables are the factor score for policy tool support (i.e. support of empowerment tools and authority tools). In our models, least squares estimation was used to calculate estimates. The beta estimates of the fixed factors (i.e. the categorical individual characteristic variables) are interpreted as the change in the response variable (i.e. the policy tools score) when moving from the reference category to the category under examination. Differences in the means of main effects factors were compared with Bonferroni post hoc tests, with a significance level of $\alpha=0.05$. Because distribution of responses was unbalanced, Type III sum of squares was used in the modeling. We used ordinary least squares regression to examine the effects of timber harvesting attitudes on policy tool support, due to the continuous measurement level of these variables.

3.5. Case studies in 2003

Although the survey items on timber harvesting attitudes and private forest policy tools were asked both years, therefore accommodating combination of the data, there were additional questions about forestland ownership and region of residence posed to respondents only during the 2003 survey. Thus, in addition to the analyses of the combined-years database, we also separated out the 2003 data to conduct case studies that examine the relationship between these attributes and policy support. A similar procedure was taken with the 2003 data alone: factor analysis to generate factor scores, followed by statistical techniques to answer the research questions. Factor analysis diagnostics (i.e. KMO, Bartlett's tests, anti-image matrix) indicated that the data from 2003 were also well-suited to factor analysis. Exploratory factor analysis of the 2003 data revealed the same underlying factor structure (i.e. empowerment tools and authority tools) as that identified in the combined-years database. The only difference between the factor analysis with combined-years data (Table 3) and the factor analysis with 2003 data alone was that in 2003 the third survey item (i.e. there should be regulations regarding the cutting of trees on private forestland) and fourth survey item (i.e. the government should fine private forest owners who fail to practice forest conservation) loaded on both

the empowerment and authority tool factors. Consistent with the combined-years database, these items loaded more heavily on the authority tool factor than the empowerment tool factor. These factors for the 2003 data were saved as regression variables. The two factors accounted for 55.75% of the variance. Reliability for the overall scale in 2003 was $\alpha=0.83$. Case study analyses of forestland ownership and region of residence were then conducted on these 2003 factor scores.

In the case study of 2003 data we tested for (1) differences between individuals who own forestland and those who do not, (2) differences among forestland owners in terms of attributes of their ownership, and (3) differences among the general public according to region of residence. An independent samples *t*-test was used to examine the data for differences between individuals who owned forestland and individuals who did not own forestland. For those individuals who did own forestland, they also responded to additional questions about possession of a forest management plan, residency in same state as forestland, residency within one mile of forestland, possession of a vacation home or cabin within one mile of forestland, and ownership acreage amount. We performed a MANOVA on the dichotomous responses to these questions with the sub-sample of forestland owners ($n=38$). A MANOVA was also used to examine the effects of region of residence on policy tool support ($n=167$). Using the U.S. Census Bureau regions as the framework, we determined the differences in policy support between respondents residing in the Northeast, Midwest, South Atlantic, South Central (a division of the larger region, South, to provide for more evenly distributed sample size), and the West.

4. Results

In general, the American public expressed support for empowerment tools (the combination of capacity, learning, symbolic/hortatory, and incentive policies), while expressing neutral attitudes for authority tools (the combination of regulations, fines, and incentive policies) (Table 4). For empowerment tools, an overwhelming majority of respondents (94%) expressed support for such policies, with only 4%

Table 4
Descriptive statistics for policy tools subscales for 2003–2004 combined data

Subscale	Neutral score	Range of neutrality	Percentage of individuals expressing disagreement	Percentage of individuals within range of neutrality	Percentage of individuals expressing agreement
Factor 1: empowerment policy tools	−2.09722	−2.75753 to −1.43690	2%	4%	94%
Factor 2: authority policy tools	0.94682	−0.10676 to 2.00039	48%	51%	1%

holding neutral attitudes and 2% of respondents disagreeing. A Z-test indicated that the mean was significantly different from the overall neutral score ($Z=2.10$, $p=0.0179$), indicating overall agreement with empowerment tools. Parallel trends for empowerment tools were exhibited in the data from year 2003 only. Again, the mean score was significantly higher than the subscale score for a respondent with completely neutral responses ($Z=1.95$, $p=0.0256$), indicating general agreement with empowerment tools. Similar to the combined-years data, 89% of individuals in the 2003 survey supported empowerment tools.

Mean support for authority tools in combined-years was slightly below the neutral point of 0.94682. The Z-score of 0.95 ($p=0.1711$) demonstrates that the mean score was not significantly different from the neutral point, indicative of general neutrality towards authority tools. The majority of individuals (51%) held attitudes falling within the range of neutrality, with 48% of respondents disagreeing with authority tools and only 1% expressing agreement. Authority tools measured in 2003 exhibited similar trends to those in the combined data, in that the mean did not differ significantly from the neutral point, indicating neutrality ($Z=1.19$, $p=0.1170$). In 2003, a similar percentage of respondents (50%) fell within the neutral range for authority tools and 50% expressed disagreement.

Examination of the distribution of responses across the 5-point Likert response scale revealed interesting patterns in the data (Table 5). Whereas many of the items of the authority tools subscales displayed bimodal distributions, all but one of the empowerment items received agreement (generally and strongly) from over three-quarters of the respondents. No one strongly disagreed with the statement encouraging

forest owners and the government to work together (item #8). Only 1 respondent strongly disagreed with the learning statement about understanding conservation (item #7) and the symbolic/hortatory statement about positive images (item #9). Interestingly, although most people tended to disagree with the first two items representing authority tools, both of which described the right of government to regulate private forests, more people supported the third item, which described regulations regarding cutting trees on private lands. A majority of respondents expressed support for incentives (67%), whereas a minority of respondents (45.7%) expressed support for fines.

4.1. MANCOVA and regression findings

MANCOVA was used to investigate if and how people of different demographic characteristics express differing levels of support for private forest policy tools. Overall, individual characteristics of gender, race, income, political ideology, and religiosity did not explain support levels for empowerment or authority tools (Table 6). Education was the only significant predictor for both empowerment and authority tools. Regressions revealed that timber harvesting attitudes more adequately predicted empowerment tool support than authority tool support (Table 7).

4.2. Empowerment tools

The MANCOVA demographic model for empowerment tools explained approximately 14% of the variance ($R^2=0.141$) and was significant ($F=2.757$, $p=0.001$) (Table 6). Lack of fit tests were not significant ($p=0.970$), indicating that the data did fit

Table 5

Percentages of respondents in each response category for items on policy tools scale (2003–2004 combined data)

	Items	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	Total number of responses
Authority tools	1. The government should be able to regulate the use of forests located on private land.	11.5	58.5	9.1	20.3	0.6	330
	2. The government should have the right to tell private forest owners how to manage their forests.	12.2	62.2	12.5	12.8	0.3	328
	3. There should be regulations regarding the cutting of trees on private forestland.	7.3	34.8	7.9	47.0	3.0	330
	4. The government should fine private forest owners who fail to practice forest conservation.	6.8	36.1	11.4	41.7	4.0	324
Loads on both	5. There should be financial incentives, such tax credits or grants, to encourage private forest owners to practice conservation.	5.2	23.5	4.3	53.7	13.3	324
Empowerment tools	6. The government should conduct work shops on forest conservation techniques for private forest owners.	1.8	8.9	10.8	64.3	14.2	325
	7. The government should promote understanding of forest conservation.	0.3	2.4	4.9	76.0	16.4	329
	8. The government and private forest owners should work together toward forest conservation.	0	2.7	6.3	74.1	16.9	332
	9. The government should use positive images, such as Smokey the Bear, to promote forest conservation.	0.3	6.1	14.1	69.9	9.5	326
	10. The government should use negative images, like floods and mudslides, to show the negative consequences of not conserving forests.	1.5	11.7	19.4	59.0	8.3	324

the model (i.e. not lacking fit). The only individual characteristic that demonstrated significance in shaping support for empowerment tools support was education ($F=4.273$, $p=0.001$). The most support was expressed by individuals with some college, college degrees, or post-graduate degrees. In general, support for empowerment tools increased with increasing education levels. Bonferroni-adjusted comparisons of estimated marginal means revealed significant differences between those with some college, a college degree, or a post-graduate degree and those individuals with vocational/technical training.

OLS regression with timber harvesting attitudes predicting empowerment tool support generated a significant model ($F=36.225$, $p<0.001$), with an $R^2=0.280$ (Table 7). The first two timber harvesting attitudes, “harvesting for present benefits” and

“harvesting for economic and utilitarian reasons” were negatively related, whereas the third subscale “harvesting as a management tool” was positively related to empowerment tool support.

4.3. Authority tools

The MANCOVA demographic model for authority tools explained approximately 15% of the variance ($R^2=0.152$) and was significant ($F=3.000$, $p<0.001$) (Table 6). Lack of fit scores were not significant ($p=0.284$), indicating an appropriate fit of the model to the data. Similar to empowerment tools, education was important in shaping tool support ($F=2.647$, $p=0.024$). Bonferroni post hoc tests revealed that individuals with a post-graduate degree were more supportive than individuals with a high-school degree

Table 6

General linear modeling: main effects with demographics predicting policy tool support (2003–2004 combined data)

		Empowerment tools		Authority tools	
		β estimates	Mean score	β estimates	Mean score
Gender	Female	0.073	−0.048	0.100	0.216
	Male	Ref.	−0.121	Ref.	0.116
Race	Non-White	−0.049	−0.109	0.184	0.258
	White	Ref.	−0.060	Ref.	0.073
Income	Less than \$35K	0.193	0.019	0.147	0.326
	\$35K < \$75K	0.076	−0.098	−0.188	−0.009
	Greater than \$75K	Ref.	−0.174	Ref.	0.179
Education	Less than high school	−0.285	−0.100	−0.579	0.172
	High school grad	−0.406	−0.221	−0.848 ^a	−0.097a
	Vocational/tech. training	−0.864 ^a	−0.679a	−0.862 ^a	−0.111a
	Some college	−0.115	0.070b	−0.577 ^a	0.174
	College grad	0.054	0.239b	−0.649 ^a	0.103
Political party	Post-grad	Ref.	0.185b	Ref.	0.751b
	Republican	−0.009	0.000	−0.522 ^a	−0.122a
	Independent	−0.272	−0.263	−0.180	0.219
Political ideology	Democrat	Ref.	0.009	Ref.	0.399b
	Conservative	−0.277	−0.223	0.130	0.231
	Liberal	Ref.	0.054	Ref.	0.100
Religiosity	Not-religious	−0.160	−0.164	0.185	0.258
	Religious	Ref.	−0.004	Ref.	0.073
Age		−0.002		0.004	
Intercept		0.492		0.522	
R^2 (Adjusted R^2)		0.141 (0.090)		0.152 (0.101)	
F statistic		2.757 ($p=0.001$)		3.000 ($p<0.001$)	

Letters (a and b) indicate significant differences as detected by pairwise comparison of estimated marginal means, with Bonferroni adjustment for multiple comparisons.

^a Significant at $\alpha=0.05$ with respect to the reference category (Ref.).

or vocational/technical training. Political party was also significant in the authority tools MANCOVA ($F=5.699$, $p=0.004$), wherein Republicans were less supportive of authority tools than Democrats.

Unlike empowerment tools, not all timber harvesting attitudes were significant in the OLS regression predicting authority tool support (Table 7). Although the model was significant ($F=15.655$, $p<0.001$),

only “harvesting for present benefits” was significant, with $\beta=-0.372$ ($p<0.001$).

4.4. 2003 case study findings

The case studies on the data collected in 2003 examined: (1) the influence of forestland ownership on policy tool support (t -test for owners versus non-

Table 7

Ordinary least squares regression: timber harvesting attitudes predicting policy tool support (2003–2004 combined data)

	Empowerment tools		Authority tools	
	β estimate	Standard error	β estimate	Standard error
THA 1—harvesting for present benefits	−0.378***	0.050	−0.372***	0.055
THA 2—harvesting for economic and utilitarian reasons	−0.118*	0.049	−0.056	0.055
THA 3—harvesting as a management tool	0.333***	0.050	−0.059	0.056
Intercept	−0.029	0.050	0.007	0.055
R^2 (adjusted R^2)	0.280 (0.273)		0.144 (0.135)	
F statistic	36.225***		15.655***	

*** $p<0.001$; * $p<0.05$.

owners), (2) the influence of an owner's forestland attributes on policy tool support (MANOVA), and (3) differences among the general public by region of residence (MANOVA). Similar to the combined-years analyses, case study analyses were conducted with the factor scores (empowerment and authority tools) that were saved as regression variables. The difference being that the case study was conducted on factor scores derived from data of year 2003 only. Individuals owning forestland were more supportive of empowerment tools than non-owners ($t = -2.575$, $p = 0.011$). There was not a significant difference between owners and non-owners in support for authority tools.

Of the 38 individuals who did own forestland, the MANOVA model for ownership characteristics (i.e. possession of management plan, residency in same state, residency near forestland, vacation home near forestland, and acreage amount) and empowerment tools was not significant. The MANOVA model for forestland ownership characteristics and authority tools was significant ($F = 5.058$, $p = 0.002$). Authority tool support related to acreage in that people who owned less than 10 acres were more supportive than individuals with owning 10 or more acres ($F = 0.112$, $p = 0.012$). People who possessed a management plan for their forestland were supportive of authority tools, whereas those who did not have a management plan expressed disagreement with authority tools on private forests ($F = 16.942$, $p < 0.001$).

In a separate MANOVA, Census region was significantly related to both empowerment ($F = 4.038$, $p = 0.004$) and authority tools ($F = 3.413$, $p = 0.011$). Bonferroni post hoc revealed that residents of the West were more supportive of empowerment tools than residents of the Midwest ($p = 0.017$) or South Atlantic ($p = 0.018$). Similarly, people residing in the West were more supportive of authority tools than individuals living in the Midwest ($p = 0.018$).

5. Discussion

Through this research, we (1) developed a scale for measuring private forest policy tool preference, (2) assessed the American public's support for private forest policy tools, (3) determined the role of individual demographics characteristics on policy support, (4) explored how timber harvesting attitudes

influence private forest policy tool support, and (5) offer policy recommendations. The framework developed in this research should enable policy makers to better understand public views regarding policies related to private forest conservation. Public attitudes exert influence throughout the policy process. Interests of constituencies, especially as they are perceived by policy makers, drive agenda-setting of agencies and representatives, contribute to policy development, and provide rationales for policy decisions (Schneider and Ingram, 1993). Further, gauging these attitudes prior to policy formulation can serve as a measure for how policies may be received following enactment. Many times, policy ideas originate from individuals or groups in the public (Gray and Lowery, 2000). In a study of the origins of policy ideas for Minnesota legislators, Gray and Lowery (2000) found that individual constituents and a policy maker's own experiences were two influential sources of policy ideas throughout the policy-making process. Policy is and should continue to be informed by the ideas of the populace. This study illuminates this critical link between public attitudes and policy creation and implementation by presenting information on public preferences for private forest policies.

The reliable private forest policy tools scale that we developed in this study is theoretically grounded and empirically refined. This scale may serve as a valuable means to determine public support for various policy tools, thus facilitating development and implementation of private forest policies more palatable to the public. We found that the American public appears not to conceptualize private forest policies in the 5-tool scheme (Schneider and Ingram, 1990). Rather, the public seems to perceive a 2-tool policy framework composed of authority and empowerment tools. This more closely parallels the tool framework of carrots, sticks, and sermons (Bemelmans-Videc et al., 1998).

Interestingly, however, the public views incentives and fines in both lights—as both a form of authority and as an empowering policy mechanism. This likely speaks to the range of incentive policies that exist, whereby the public may classify policy initiatives such as cost-share programs (i.e. Farm Bill programs such as CRP) as more empowering, because these policies provide the skills and tools to achieve the desired behavior. Other initiatives, such as tax

abatement programs, may be perceived as more regulatory, perhaps because there are ramifications to not properly following the program guidelines. The public's perceptions of a private forest policy tool framework also appear to reflect differences in the longevity of policy-induced behaviors. A regulation or incentive may induce a certain behavior for the duration of the policy, but because there has been no shift in attitude, the policy target may return to previous behaviors resulting from the underlying attitudes (Pretty and Ward, 2001). Empowerment tools, comprised of capacity, learning, and symbolic/hortatory tools, may be perceived as more attitude-shifting, rather than behavior-inducing or forcing. These tools precipitate underlying attitude changes especially through learning, which then drive behavioral changes.

In general, the American public was supportive of empowerment tools (inclusive of incentives) and was neutral with respect to tools that are more regulatory and authoritative. Many existing private forest policies, especially those at the federal level, could be categorized as empowerment and incentive tools, whereas fewer policies are authority in nature (Best and Wayburn, 2001; Kilgore and Blinn, 2004). People may be more familiar with empowerment tools and less inclined to view them as threatening. Public opinion of private forestland policies, especially those that are regulatory, may be shaped by concern regarding burdensome cost, excessive policies, and neglect of other important social and political issues (Guber, 2003). We also found that level of support for authority tools varied by the amount of specificity associated with the policy. People appeared to express more agreement for statements that discussed specific authority purposes (i.e. limiting cutting) than statements that gave broader authority (i.e. regulate the use or management of forests). This may be an important consideration in policy construction and delivery: policies that clearly delineate how they affect private forests (i.e. limitations to harvests or requirements for harvesting practices) will likely receive more public support than policies that broadly control private forest use and management.

Education was the only individual characteristic that affected support for both policy tool measures. Other demographic predictors such as race, gender, and religiosity did not contribute to policy support.

We hypothesized that political party would shape support for both tools, but it only played a role in support for authority tools. Analyses of NORC General Social Survey data found that political stances are the most important influence on environmental concern and policy preference (Guber, 2003). This work, however, seems to indicate that political party is not consistent in predicting support for various private forest policy tools. Future models to predict policy preference must examine other individual attributes and attitudes, as our models did not explain a large percentage of the variance. Congruent with past research, we did not find major differences in support for regulations between policy targets (i.e. forestland owners) and the general public (i.e. those who do not own forestland) (Bliss et al., 1994; Bourke and Luloff, 1994). However, we did detect differences in support for empowerment tools. People who own forestland are more supportive of empowerment tools; perhaps because these individuals feel that such policies enable them to achieve their own goal, which is also the policy goal—private forestland stewardship and conservation. Similarly, qualitative research in Pennsylvania found that forest landowners supported incentive and technical-assistance type policies for riparian forest conservation (Dutcher et al., 2004). This research suggests that the policy targets are supportive of such voluntary policy measures and would likely respond to empowerment tools.

Regional differences were found in the 2003 case study, wherein residents of the Western U.S. were consistently more supportive of both empowerment and authority private forest policy tools. Analyses of the bases of these differences are not possible with this research, but speculation on why these differences exist is warranted. Does the prevalence of Forest Practices Acts (for private forests) in Western states, as compared to Midwestern and Southern states, result in increased support for these types of tools? Or, does the prominence of more heavily regulated public land influence Western U.S. residents to favor regulatory forest policies, and thus contribute to their support for such policies on private forests?

Timber harvesting attitudes significantly influenced private forest policy support. Previous research has demonstrated that values and attitudes shape support of different policy types (Pregernig, 2001; Rauwald and Moore, 2002), which is supported by

this research. In general, attitudes associated with timber harvesting for present and economic benefits were correlated with less support for policy regimes to promote private forestland conservation. Policies that promote forest conservation in order to provide for future generations and that use legacy as a mission and rationale of the policy, while still considering rights to harvest and private property rights, will likely have improved reception with the general public. Because findings of this research indicate that there is a negative association between timber harvesting attitudes for present or economic benefits and policy support, policy makers will need to consider how public policies targeted at private forest landowners will be perceived in terms of limiting or enabling timber harvesting for such benefits. Additionally, a positive association exists between support for empowerment policy tools and attitudes toward using harvesting as a management tool.

Thus, it is interesting to consider how the attitudes of the forestland-owning public may be shifting due to exurbanization trends. Studies have established that landowners seek multiple benefits from the forestland and recent studies of “new rural residents” indicate that this new and growing cadre of landowners expresses increased support for non-consumptive values, such as amenity, aesthetic, conservation, recreation, and lifestyle values (Egan and Luloff, 2000; Kendra and Hull, 2005). Further, these new forest landowners appear receptive to forest management and conservation, but require the requisite information and skills to conduct such management (Hull et al., 2004; Kendra and Hull, 2005). Empowerment policy tools that facilitate management activities that provide for the underlying values of private forestland (e.g. amenity, recreation, etc.) may receive support from this new and potentially influential type of forest landowner.

Increased attention is being given to the role that private forests play in landscape-level sustainability, as well as the suite of laws that currently govern private forestland in the United States (e.g. the special issue on Family Forests, *Journal of Forestry*, October/November 2004). The number of private forest owners has increased dramatically, yet federal funding for private forest conservation has oscillated over the years and currently falls short of need, with the programs such as Forestland Enhancement Program no longer receiving

funding (Best and Wayburn, 2001). Conservation of this integral part of the overall landscape sustainability lies with the creation of more effective policies for this resource, which starts with consideration of the policy’s reception by the targeted audience and the public stakeholders. The general nature of support or neutrality for policies on private forests suggests that the time may be ripe for consideration of additional private forest policies. Perhaps the most important finding of this research is that the public polled in this research did not strongly oppose any of these policy tools. Slightly less than half of the individuals polled disagreed with authority tools. A large majority of the public supported empowerment tools for private forestland conservation. These levels of public support for private forestland policies, coupled with findings from a recent meta-analysis emphasizing the prominence of empowerment-type policies (as compared with other determinants, such as market conditions and owner attributes) in increasing forest management on private forests (Beach et al., 2005), lead us to conclude that improved empowerment policies for private forests would be positively received and result in forest conservation gains.

5.1. Limitations

Although we present valid and reliable findings, we offer several caveats regarding the findings. First, the sample size is large enough to conduct the statistics herein, but it is not completely representative of the American public, and thus generalizability is limited. This lack of representativeness is present in many telephone surveys and must be considered when extrapolating to the population. Second, the R^2 values in the MANCOVA indicate that the models do not explain a large portion of the variance. However, we believe they offer insight into how individual attributes affect policy support. Third, the case study we conducted on 2003 data of forestland ownership and region of residence also has reduced generalizability due to small sample size. Fourth, the 2-tool policy framework presented herein is a result of our data, which a snap-shot of American public opinion. Public opinion is notoriously dynamic. Nonetheless, these findings provide information on private forest policy support and serve as a platform for future research.

5.2. Future research

Future research expanding on this work should consider additional tools available for private forest conservation, such as market tools or additional cultural tools (Best and Wayburn, 2001). One example of a market tool could be a conservation easement, through which certain rights to the land are purchased in perpetuity, such as the current Forest Legacy Program. Further, non-governmental organizations are playing an important role in private forestland conservation efforts, with programs such as the Nature Conservancy's Forest Bank Program. This would be an interesting aspect to incorporate into future research, enabling researchers and policy-makers to better understand what role the public feels non-governmental organizations should have in forestland conservation.

Best and Wayburn (2001) consider cultural tools to be communication, education, and assistance, the latter two notions encompassed in the empowerment tool framework of this paper. These tools are developed to engage both private forest landowners and the broader public. They include more traditional government programs such as the Forest Stewardship Program and Master Woodland Manager Program, as well as institutions and organizations developing outside of the public policy arena, such as forest owner associations, landowner cooperatives, and community-based natural resources management (Best and Wayburn, 2001). Cultural efforts may provide the departure point for a shift in thinking as related to private forestland, wherein stewardship of these lands takes on societal significance. New policies for private forests that focus on cultural and communicative efforts may strengthen the social contract between private forest owners and society. Bliss (2001) maintains that this social contract, especially as it connects forest owners to each other and to society and markets, is a key component of private forestland conservation and sustainability. In addition to exploring the correlation between timber harvesting attitudes and private forestland policies, future research should seek to examine the relationship between overall concern for forestland conservation (e.g. perceived immediacy and importance) and policy preference. Future research should also explicitly examine preferences of government level (local,

state, regional, and/or federal) in private forestland policy.

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